

Application Serial No.: 09/671,166
Applicant(s): Chrisey et al.

Docket No.: N.C. 82,745

REMARKS

Reconsideration of the above-identified application is respectfully requested.

Claims 1-19 remain in the application. Claim 1 has been amended to more particularly point out and distinctly claim the subject matter that the Applicants regard as their invention. Support for the amendment can be found on page 5, lines 14-16. No new matter has been added.

I. Rejection under 35 U.S.C. § 103(a): Joyce Jr. in view of Roberts

Claims 1, 2, 5, 8-9, 12, 14-15 and 17-18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,292,559 to Joyce Jr. et al. in view of U.S. Patent No. 3,787,210 to Roberts. The Examiner noted that Joyce Jr. does not teach the coating on the front surface of the target substrate is a mixture of the transfer material to be deposited and a matrix material, wherein the matrix material has the property of being or becoming more volatile than the transfer material when exposed to the source of pulsed laser energy. Therefore, the Examiner supplemented Joyce Jr. with Roberts' matrix material, which has the property of being or becoming more volatile than the transfer material when exposed to laser energy.

Applicants respectfully submit that claims 1, 2, 5, 8-9, 12, 14-15 and 17-18 are not obvious over Joyce Jr. in view of Roberts. A prima facie case of obviousness requires the Examiner to provide, inter alia, "some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references." *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). See also *In re Wilder*, 166 U.S.P.Q. 545, 548 (C.C.P.A. 1970); *In re Rinehart*, 189 U.S.P.Q. 143, 147 (C.C.P.A. 1976); *In re Fritch*, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992).

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A reference that teaches away from the claimed invention undermines its value as prior art in an obviousness rejection. See generally *In re Sponnoble*, 405 F.2d 578, 587 (C.C.P.A. 1969); *In re Caldwell*, 319 F.2d 254, 256 (C.C.P.A. 1963). A reference teaches away "when a person of ordinary skill, upon reading the reference, could be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant." *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994). There is "strong evidence of unobviousness" when an inventor proceeds contrary to the desired conditions stated in a prior art reference." *In re Hedges*, 228 U.S.P.Q 685, 687 (Fed. Cir. 1986). In *Hedges*, the Federal Circuit determined that there was no prima facie case of obviousness because the basic reference relied on by the Examiner made clear that using low temperatures was the desired condition, while the application in dispute used a higher temperature.

The process described by Joyce Jr. involves heterogeneous layers in which the energy density hits a powder and breaks it up. According to Joyce Jr., "By the use of a high energy density, within a controlled range, as hereinafter explained, it was possible to achieve excellent adhesion and desirable spot shape definition of the composite to the target area." (Col. 3, lines 32-35) Joyce Jr. notes that in a prior patent "it was believed that an energy density of 7 J/cm² was sufficient." (Col. 5, lines 33-34) However, Joyce Jr. noted that "[t]hrough further research, it was discovered that to achieve good adhesion and imaging, i.e. good spot definition, much higher energy densities were required, and that in fact an energy density window existed." (Col. 5, lines 36-40) Specifically, Joyce Jr. teaches that the energy density window is 8 J/cm² to 20 J/cm², preferably 12 J/cm² to 18 J/cm². (Col. 5, lines 41-44) Thus Joyce Jr. teaches away from using low energy densities, especially energy densities below 12 J/cm².

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The present invention uses a homogeneous composite instead of heterogeneous layers and a soft transfer process so the entire powder is transferred instead of it being broken up. The materials used in the present invention are more fragile than those used in Joyce Jr. and need lower energy densities. The energy density used by Joyce Jr. would cause irreversible damage to the materials of the present invention. Energy densities for the present invention range from 0.05 J/cm² to 10 J/cm², and are typically 0.1 J/cm² to 2 J/cm². (Page 19, line 9). Since Joyce Jr. teaches away from using energy densities this low, it does not render obvious the subject matter of the present invention.

Joyce Jr. does not disclose "a source of pulsed laser energy with an energy density from 0.05 to 7.5 J/cm²," "a target substrate comprising a laser-transparent support having . . . a front surface, wherein the front surface has a coating that comprises a mixture of the transfer material to be deposited and a matrix material, wherein the matrix material has the property of being or becoming more volatile than the transfer material when exposed to pulsed laser energy," or "means for positioning the source of pulsed laser energy . . . such that in operation pulsed laser energy is directed . . . to strike . . . with sufficient energy to volatilize the matrix material causing the coating to desorb from the location and be lifted from the surface of the support without damaging the transfer material" as described in independent claim 1. Roberts does not make up for the inadequacies of Joyce Jr.; specifically, Roberts does not disclose using an energy density from 0.05 to 7.5 J/cm² or that the volatilization does not damage the transfer material. Thus, Applicants respectfully submit that the hypothetical combination of Joyce Jr. and Roberts does not render obvious independent claim 1 or claims 2, 5, 8-9, 12, 14-15 and 17-18, which are dependent on claim 1.

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II. Rejection under 35 U.S.C. § 103(a): Joyce Jr. and Roberts in view of Itoh

Claims 3 and 4 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Joyce Jr. et al. and Roberts as applied to claims 1, 2, 5, 8-9, 12, 14-15 and 17-18 above, and further in view of U.S. Patent No. 4,702,958 to Itoh et al. The Examiner noted that the combination of Joyce Jr. and Roberts does not disclose the particle size of the transfer material. Therefore, the Examiner supplemented Joyce Jr. and Roberts with the Itoh transfer material having grain sizes between 10nm and 20µm. Itoh does not make up for the inadequacies of Joyce Jr. and Roberts discussed above and, therefore, the hypothetical combination of Joyce Jr., Roberts and Itoh does not render obvious the subject matter of claims 3 and 4.

III. Rejection under 35 U.S.C. § 103(a): Joyce Jr. and Roberts in view of Blanchet-Fincher

Claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Joyce Jr. et al. and Roberts as applied to claims 1, 2, 5, 8-9, 12, 14-15 and 17-18 above, and further in view of U.S. Patent No. 5,288,528 to Blanchet-Fincher. The Examiner noted that the combination of Joyce Jr. and Roberts does not disclose the use of a polymer as the transfer material. Therefore, the Examiner supplemented Joyce Jr. and Roberts with the Blanchet-Fincher polymer transfer material. Blanchet-Fincher does not make up for the inadequacies of Joyce Jr. and Roberts discussed above and, therefore, the hypothetical combination of Joyce Jr., Roberts and Blanchet-Fincher does not render obvious the subject matter of claim 6.

IV. Rejection under 35 U.S.C. § 103(a): Joyce Jr. and Roberts in view of Kodas

Claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Joyce Jr. et al. and Roberts as applied to claims 1, 2, 5, 8-9, 12, 14-15 and 17-18 above, and further in view of

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U.S. Patent No. 6,165,247 to Kudas et al. The Examiner noted that the combination of Joyce Jr. and Roberts does not disclose the use of a transfer material which comprises metal of ceramic particles coated with an organic precursor. Therefore, the Examiner supplemented Joyce Jr. and Roberts with Kudas's use of metal particles used to form a thin film being coated with an organic precursor. Kudas does not make up for the inadequacies of Joyce Jr. and Roberts discussed above and, therefore, the hypothetical combination of Joyce Jr., Roberts and Kudas does not render obvious the subject matter of claim 7.

V. Rejection under 35 U.S.C. § 103(a): Joyce Jr. and Roberts in view of Williams

Claims 10 and 11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Joyce Jr. et al. and Roberts as applied to claims 1, 2, 5, 8-9, 12, 14-15 and 17-18 above, and further in view of U.S. Patent No. 4,987,006 to Williams et al. The Examiner noted that the combination of Joyce Jr. and Roberts does not disclose the use of an addition polymer as a matrix material. Therefore, the Examiner supplemented Joyce Jr. and Roberts with Williams's use of addition polymers as a matrix material. Williams does not make up for the inadequacies of Joyce Jr. and Roberts discussed above and, therefore, the hypothetical combination of Joyce Jr., Roberts and Williams does not render obvious the subject matter of claims 10 and 11.

VI. Rejection under 35 U.S.C. § 103(a): Joyce Jr. and Roberts in view of Williams (II)

Claim 13 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Joyce Jr. et al. and Roberts as applied to claims 1, 2, 5, 8-9, 12, 14-15 and 17-18 above, and further in view of U.S. Patent No. 5,135,870 to Williams (II) et al. The Examiner noted that the combination of Joyce Jr. and Roberts does not disclose the use of a matrix material selected from the group

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which includes water, aryl solvents, arene solvents, halogenated organic solvents, hydrocarbons, ketones, esters, ethers, carboxylic acids, phenols and phosphoric acid. Therefore, the Examiner supplemented Joyce Jr. and Roberts with the Williams (II) matrix material. Williams (II) does not make up for the inadequacies of Joyce Jr. and Roberts discussed above and, therefore, the hypothetical combination of Joyce Jr., Roberts and Williams (II) does not render obvious the subject matter of claim 13.

VII. Rejection under 35 U.S.C. § 103(a): Joyce Jr. and Roberts in view of Isomi

Claim 16 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Joyce Jr. et al. and Roberts as applied to claims 1, 2, 5, 8-9, 12, 14-15 and 17-18 above, and further in view of U.S. Patent No. 5,401,616 to Isomi et al. The Examiner noted that the combination of Joyce Jr. and Roberts does not disclose the application of the transfer/matrix mixture by a coating method selected from the group consisting of spin coating, ink jet deposition, jet vapor deposition, spin spray coating, aerosol spray deposition, electrophoretic deposition, pulsed laser deposition, matrix assisted pulsed laser evaporation, thermal evaporation, sol gel deposition, chemical vapor deposition, sedimentation and screen printing. Therefore, the Examiner supplemented Joyce Jr. and Roberts with the Isomi coating application method. Isomi does not make up for the inadequacies of Joyce Jr. and Roberts discussed above and, therefore, the hypothetical combination of Joyce Jr., Roberts and Isomi does not render obvious the subject matter of claim 16.

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VIII. Rejection under 35 U.S.C. § 103(a): Joyce Jr. and Roberts in view of Tatah

Claim 19 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Joyce Jr. et al. and Roberts as applied to claims 1, 2, 5, 8-9, 12, 14-15 and 17-18 above, and further in view of U.S. Patent No. 5,814,165 to Tatah et al. The Examiner noted that the combination of Joyce Jr. and Roberts does not disclose means to position the source of the pulsed laser with respect to the receiving substrate whereby the receiving substrate can be pretreated or whereby a transfer material deposited on the substrate can be annealed or etched. Therefore, the Examiner supplemented Joyce Jr. and Roberts with the Tatah means to position the source of the pulsed laser energy with respect to the receiving substrate. Tatah does not make up for the inadequacies of Joyce Jr. and Roberts discussed above and, therefore, the hypothetical combination of Joyce Jr., Roberts and Tatah does not render obvious the subject matter of claim 19.

IX. Response to Arguments

The Examiner noted that Applicant's arguments filed on May 6, 2003, with respect to the rejection under 35 U.S.C. § 103(a), Joyce Jr. in view of Roberts, was fully considered but not persuasive. Specifically, the Examiner asserted that there are no structural differences between the prior art and the present Application and provided the following quote from *Ex parte Masham*, 2 U.S.P.Q.2d 1647 (B.P.A.I. 1987): a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim.

Applicants point out that *Masham* involved an anticipation rejection, not an obviousness rejection. According to *In re Mills*, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990), a rejection based on the

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only differences between the prior art and the claimed invention being in the functional language of the claim is only proper for an anticipation rejection under 35 U.S.C. § 102 and not an obviousness rejection. Since the present invention only involves an obviousness rejection, Applicants respectfully submit that *Masham* is not applicable.

Examiners must give patentable weight to functional limitations even if the functional limitations are the only limitations that are nonobvious over the prior art. *In re Mills*, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990). See also *In re Ludtke*, 169 U.S.P.Q. 563, 566 (C.C.P.A. 1971) ("We agree with the Patent Office that the spatial separation between the panels is recited in functional language; however, as we said recently in *In re Swinehart*, . . . there is nothing intrinsically wrong with the use of such claim language."); *In re Attwood*, 148 U.S.P.Q. 203, 210 (C.C.P.A. 1966) ("We have here a combination claim and the limitations ignored by the board as use limitations we think are functional expressions which must be given weight."). In *Mills*, the prior art disclosed all of the structure of the rejected apparatus claim; the only differences were in the functional limitations of the "pump means and the feed means providing a pumping capacity . . . such that in operation air is drawn into the mixing chamber, and air entrained in the mixed ingredients." The Federal Circuit determined that the claim was nonobvious over the prior art based on the functional limitations and stated that "[w]hile Mathis' apparatus may be capable of being modified to run the way Mills' apparatus is claimed, there must be a suggestion or motivation in the reference to do so." *In re Mills* at 1432 (citing *In re Gordon*, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984) ("The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification.")).

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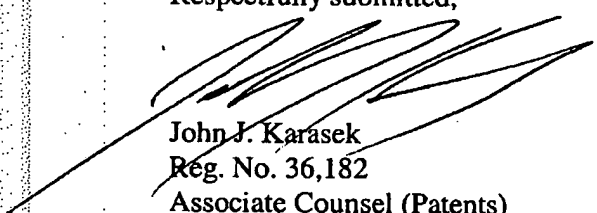
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Referring to the Applicants argument above in Section I, Joyce Jr. does not suggest using the energy densities of the claimed invention and, in fact, teaches against it. Therefore, Applicants respectfully submit that claims 1-19 are not obvious because the combination of cited references do not teach or suggest "a source of pulsed laser energy with an energy density from 0.05 to 7.5 J/cm²," "a target substrate comprising a laser-transparent support having . . . a front surface, wherein the front surface has a coating that comprises a mixture of the transfer material to be deposited and a matrix material, wherein the matrix material has the property of being or becoming more volatile than the transfer material when exposed to pulsed laser energy," or "means for positioning the source of pulsed laser energy . . . such that in operation pulsed laser energy is directed . . . to strike . . . with sufficient energy to volatilize the matrix material causing the coating to desorb from the location and be lifted from the surface of the support without damaging the transfer material" as recited in independent claim 1.

In view of the foregoing, it is respectfully submitted that this application is ready for allowance. Kindly charge any additional fees due, or credit overpayment of fees, to Deposit Account No. 50-0281.

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